

Wuchang Bream (*Megalobrama amblycephala*) Fry to Fingerling Growth Performance on Soymeal-Based Feeds

Results of ASA/China 2000 Feeding Trial 35-00-094

Michael C. Cremer, Zhang Jian and Zhou Enhua
American Soybean Association
Room 902, China World Tower 2
No. 1 Jianguomenwai Avenue
Beijing 100004, P.R. China

ABSTRACT

A feeding trial was conducted at the Tai Xing Fish Stock Farm in Tai Xing, Jiangsu Province, to demonstrate the fry to fingerling growth performance of wuchang bream using the ASA 80:20 production model and ASA soymeal-based fry and fingerling feeds. Fish were stocked in three, 2.0-mu ponds at densities of 5,000 wuchang bream and 800 silver carp fry per mu. Wuchang bream grew from 0.2 g to an average weight of 43.8 g per fish in 117 days of feeding. Gross production averaged 189.1 kg/mu for wuchang bream and 60.5 kg/mu for silver carp. Average survival rates for wuchang bream and silver carp were 86.4% and 96.4%, respectively. Wuchang bream FCR for the combination of ASA fry and fingerling feeds was 1.36:1. Net economic return for the three trial ponds averaged RMB 392.61/mu per mu. ROI averaged 18%. Results of the feeding demonstration showed that wuchang bream fed well on extruded, floating feed, and exhibited good growth performance, FCR, survival and economic return with the ASA soymeal-based feeds and 80:20 production technology.

INTRODUCTION

The American Soybean Association (ASA), in cooperation with the China National Fisheries Extension Center (NEC), the Jiangsu Provincial Fisheries Extension Center, and the Tai Xing Fish Stock Farm, conducted a 4-month fry to fingerling feeding trial with wuchang carp. The objective of the trial was to demonstrate wuchang bream growth and economic performance from fry to fingerling stages with ASA soymeal-based, extruded feeds and the ASA 80:20 pond production model.

MATERIALS AND METHODS

Three, 2.0-mu ponds at the Tai Xing Fish Stock Farm in Tai Xing, Jiangsu Province, were used for the feeding trial. Pond water depth averaged approximately 1.5 m. All ponds were equipped with water exchange and stand-by aeration.

Fish were "summer flower" stage wuchang bream fry that were produced by the Tai Xing Fish Stock Farm in fertilized ponds in the month preceding the trial. Wuchang bream having an average weight of 0.2 g per fish were stocked in the three trial ponds at a density of 5,000 wuchang carp per mu, together with 800 silver carp fry per mu. Fish were of uniform size and age at stocking.

Wuchang bream were fed soymeal-based fry and fingerling feeds formulated by ASA (Table 1). A 41/11 fry feed was fed in crumble form from fish size 0.2 g to fish size 4-5 g. At fish size 4-5 g, wuchang bream were weaned over a 5-day period to a 36/7 fingerling feed in extruded, floating pellet form (Table 1). Initial 36/7 feed pellet size was 1.5 mm. Fish feeding rate and frequency varied with fish size and water temperature following ASA guidelines.

Trial management was based on the ASA 80:20 pond production model. Fish in all ponds were sampled once per month on the same date each month. At the conclusion of the trial, all ponds were drained and the wuchang and silver carp in each pond counted and weighed to determine average fish weight, gross and net production, feed conversion ratio (FCR) and survival.

RESULTS

Wuchang bream were fed a total of 117 days between late June and mid-October 2000. Wuchang bream grew from 0.2 g to 43.8 g during this feeding period (Figure 1; Table 2). Gross production averaged 189 kg/mu (2,835 kg/ha) for wuchang bream and 60 kg/mu (900 kg/ha) for silver carp (Table 2). The ratio of fed wuchang bream to filtering silver carp at harvest was 76:24. Average wuchang and silver carp survival rates were 86.4% and 96.4%, respectively. FCR for the combination of ASA fry and fingerling feeds averaged 1.36:1 for the approximately 26,000 fingerlings harvested from the trial ponds.

Net economic return for the demonstration trial was RMB 393 per mu (Table 2). ROI averaged 18% for the three trial ponds (Table 2).

SUMMARY AND CONCLUSIONS

Wuchang bream exhibited good growth, FCR, survival and economic return when cultured using the ASA 80:20 pond production model and soymeal-based fry and fingerling feeds. Results indicated that wuchang bream could have been stocked at a higher density without exceeding the carrying capacity of the ponds. Gross production of 189 kg/mu for wuchang bream was significantly below the recommended maximum carrying capacity of approximately 400 kg/mu. In addition, wuchang bream could have been cultured for an additional 3-4 weeks to increase fingerling fish size and gross fish production. The Tai Xing farm estimated that wuchang bream could have grown an additional 20-25% if they had been fed through mid-November. Feeding was halted on 17 October for collection of data for ASA.

The use of soymeal-based extruded feed resulted in the maintenance of good water quality in the three trial ponds throughout the 117-day feeding period. Water transparency was maintained at ≥ 30 cm and no oxygen depletion or disease problems occurred in the trial ponds. The Tai Xing farm reported that wuchang bream growth was more rapid than other bream species tested at the farm.

ACKNOWLEDGEMENTS

ASA gratefully acknowledges the Tai Xing Fish Stock Farm, the Jiangsu Fisheries Extension Center, and the Director and staff of the National Fisheries Extension Center for their assistance and support for this aquaculture trial.

Chinese Currency and Production Unit Conversions:

RMB 8.26 = US\$1.00
15 mu = 1.0 hectare (ha)
kg/mu x 15 = kg/ha
1.0 kg = 2.2 lb
6 mu = 1.0 acre (ac)
kg/mu x 13.2 = lb/ac

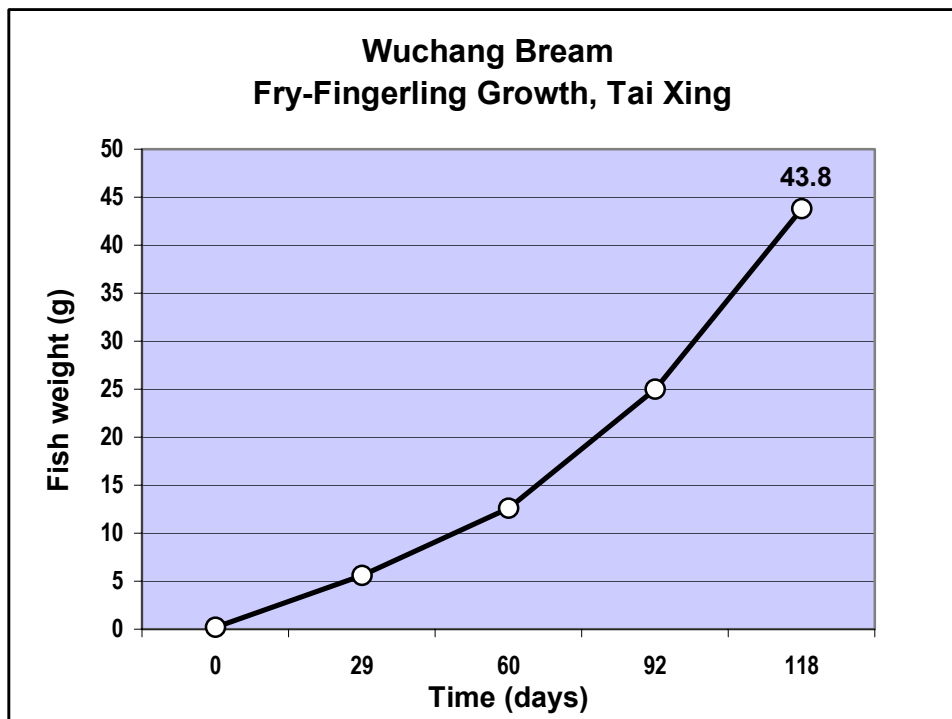


FIGURE 1. Growth curve for wuchang bream grown from advanced fry to fingerlings using soymeal-based, extruded feeds and the ASA 80:20 pond production model. Wuchang bream grew from 0.2 g to 43.8 g in 117 days of feeding at the Tai Xing Fish Stock Farm in Tai Xing, Jiangsu Province, China.

Table 1. Formulations for the ASA 41/11 fry and 36/7 fingerling feed rations used in the 2000 wuchang bream fry to fingerling feeding demonstration trial at the Tai Xing Fish Stock Farm in Tai Xing, Jiangsu Province, China.¹

| Ingredient | 41/11 Fry Feed | 36/7 Fingerling Feed |
|-------------------------|----------------|----------------------|
| Soybean meal 47.5 | 46.30 | 46.30 |
| Wheat, SWW | 13.00 | 19.00 |
| Wheat middlings | ----- | 8.00 |
| Corn gluten meal 60% | 15.00 | 10.00 |
| Fishmeal, Anchovy 65/10 | 14.00 | 8.00 |
| Fish oil | 4.03 | 4.58 |
| Soy oil | 4.00 | ----- |
| Soy lecithin | 1.50 | 1.50 |
| Ca phosphate mono | 1.70 | 2.20 |
| Vit PMX Roche 2118 | 0.20 | 0.15 |
| Min PMX F-1 | 0.25 | 0.25 |
| Ethoxyquin | 0.02 | 0.02 |
| Total | 100.00 | 100.00 |

¹The numerical component of the feed description refers to the percentage of protein and fat, respectively, in the ration, e.g. 41/11 indicates 41% crude protein and 11% crude fat.

TABLE 2. Results of the 2000 ASA aquaculture trial at the Tai Xing Fish Stock Farm that demonstrated fry to fingerling pond production performance of wuchang bream using the ASA 80:20 production model and ASA soymeal-based feeds.

| Pond No. | WuC ¹ stocking size (g) | Stocking rate (fish/mu) | No. days fed | Harvest wt. (g) | | P _G ³ (kg/mu) | | P _N ⁴ (kg/mu) | | Survival (%) | | FCR | Net (RMB/mu) | ROI (%) |
|-------------|------------------------------------|-------------------------|--------------|------------------|------------------|-------------------------------------|-------------|-------------------------------------|-------------|--------------|-------------|-------------|--------------|-------------|
| | | | | WuC ¹ | SiC ² | WuC | SiC | WuC | SiC | WuC | SiC | | | |
| 3 | 0.2 | 5000 | 117 | 43.3 | 81.2 | 189.9 | 61.9 | 188.9 | 61.5 | 87.7 | 95.3 | 1.36 | 409 | 18.8 |
| 4 | 0.2 | 5000 | 117 | 44.1 | 74.4 | 187.8 | 57.9 | 186.8 | 57.4 | 85.2 | 97.2 | 1.37 | 363 | 16.7 |
| 5 | 0.2 | 5000 | 117 | 43.9 | 79.9 | 189.7 | 61.4 | 188.7 | 61.4 | 86.4 | 96.7 | 1.36 | 406 | 18.6 |
| Mean | 0.2 | 5000 | 117 | 43.8 | 78.5 | 189.1 | 60.5 | 188.1 | 60.1 | 86.4 | 96.4 | 1.36 | 393 | 18.0 |

¹WuC = Wuchang bream

²SiC = Silver carp

³P_G = Gross Production

⁴P_N = Net Production